U.S. Commercial Bank Lending through 2008:Q4: New Evidence from Gross Credit Flows

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Abstract

What was hiding behind the aggregate commercial bank loans through the end of 2008? We use balance sheet data for every insured U.S. commercial bank from 1999:Q1 to 2008:Q4 to construct credit expansion and credit contraction series and provide new evidence on changes in lending. Until 2008:Q3 net credit growth was not dissimilar to the 1980 and 2001 recessions. However, between the third and fourth quarter credit contraction grew larger than credit expansion across all types of loans and for the largest banks. With the inclusion of 2008:Q4 data our series most resemble the intensification of the Savings and Loan crisis.

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I Introduction

Debate about the behavior of the banking sector has intensified in the popular press, as well as within academia, as the financial crisis continues to gather steam. Many of the questions raised about the behavior of banks during the current crisis rely on net aggregate data on bank lending activity. However, the banking sector is very heterogeneous and aggregate data can be hard to interpret if not combined with observations at the individual bank level, as argued in Chari, Christiano, and Kehoe (2008) and Cohen-Cole, Duygan-Bump, Fillat, and Montoriol-Garriga (2008).

In this paper, we use publicly available balance sheet data for the entire population of commercial banks to construct quarterly gross credit flows for the U.S. banking system during the period 1999:Q1-2008:Q4 and to provide new evidence about the behavior of regulated commercial banks during the financial crisis that began in 2007. Loosely speaking, the weighted sum of positive changes in credit for banks that increased loans is a measure of *credit expansion*, while the weighted sum of negative changes in credit is a measure of *credit contraction*. While net flows are a measure of aggregate credit change in the overall economy, gross flows are a measure of how much credit is expanding *and* contracting or the reallocation of lending across borrowers. Although we use comprehensive balance sheet data to calculate our measures of credit contraction and expansion, we caution that without actual loan origination data or a careful accounting for unused loan commitments, we cannot capture the complete dynamics of credit flows for commercial banks and therefore our results should be interpreted cautiously.

Several recent papers have highlighted the importance of considering gross credit flows rather

than net lending, in both a domestic context where credit is provided by banks (Dell'Ariccia and Garibaldi, 2005; Craig and Haubrich, 2006) and firms (Herrera, Kolar, and Minetti, 2007) and an international context where credit is provided by countries (Contessi, De Pace, and Francis, 2008). In the banking sector, aggregate changes obscure changes in gross lending and the heterogeneous patterns of contraction and expansion within regions, sectors, and groups of banks. Moreover, the elements determining bank-level credit expansion are fundamentally different from those of credit contraction. When banks increase lending, they face informational asymmetries and the costs of information acquisition, searching for new clients, or evaluating new projects. Conversely, when loans are retired due to expiry or non-performance, different costs occur, which depend on the liquidity of borrowers and on the steps that must be taken to ensure repayment. The different activities underlying expansion and contraction lead to different cyclical properties and volatility measures that we discuss in this paper.[1]

We follow two steps in our analysis of gross loan flows. First, we present several findings about gross credit flows in the U.S. banking system between 1999:Q1 and 2008:Q4 and use previous estimates by Dell'Ariccia and Garibaldi (2005) as our main term of comparison; a similar paper by Craig and Haubrich (2006) focuses more on entry and exit, which are relatively less important for the period we study.[2] We then focus on the recent financial crisis and compare behavior during the current recession to the previous four recessions to put current behavior in context.

Our results reveal that gross flows are much larger than net flows, so at any phase of the business cycle, significant credit contraction and credit expansion co-exist. We also find

significant credit contraction and expansion within banks of similar size, categories of loan - real estate, individual, commercial and industrial (C&I) - and across states. Even with the significant restructuring of the U.S. banking system and attendant reduction in the number of banks between the Dell'Ariccia and Garibaldi (2005) sample (1979 to 1999) and ours (1999 to 2008) and an increase in the size of the average bank, we find that a substantial amount of heterogeneity remains. Moreover, the heterogeneity in aggregate credit cycles cannot be explained by differences across states or across the types of loans or sizes of banks. In terms of volatility of gross flows, we find that the expansion is more volatile than the contraction, and both are larger than the volatility of GDP. Finally and importantly, expansion is also more volatile than credit contraction for each loan category except C&I loans. All but the last result are consistent with previous evidence.

In the second part of the paper, we use gross credit flow measures to compare bank lending during the recession that began in December 2007 to the patterns observed during previous recessions.[3] In the lead-up to the current recession, credit had expanded strongly in the fourth quarter of 2007, particularly for C&I loans, which is a pattern typically observed preceding peaks of economic activity. During the current recession credit expansion contracted sharply from the fourth quarter of 2007 to the first quarter of 2008 while credit contraction began to mildly rise. During the first three quarters of 2008, the behavior of our contraction and expansion series was similar to other recessions. Real estate loans and loans to C&I firms maintained relatively low but positive net growth rates through the third quarter of 2008. The picture substantially changes in the fourth quarter of 2008, when our measure of credit contraction becomes larger than credit expansion, a pattern observed only during the

1990-91 recession. Those years also witnessed the peak of the Savings and Loan crisis. We also examine the increasing use of existing commitments of various types of loans; for C&I firms this is likely a good explanation of why net credit growth was slow but not negative during the first three quarters of 2008. Thus, although net credit growth in the commercial banking sector was positive through the third quarter of 2008, even the data on the quantity of commercial banks loans for the fourth quarter show signs of distress in the industry.

The reader should be aware that our study is subject to various caveats. (i) Our comparison of the current crisis with previous recessions may be distorted by the many changes that have occurred over the past 30 years as banks have moved beyond the traditional role of providing loans to their customers. Because the Financial Services Modernization Act of 1999 allowed various types of financial institutions besides banks to freely merge and compete for loans, our sample is affected by this activity more so than the sample prior to 1999. (ii) The diffusion of securitization necessitates caution in the interpretation of our results as it may be that we observe flows that appear as loan expansion simply because they can no longer be redistributed and transformed from regular loans to securities. An even larger credit contraction may have occurred in the non-regulated banking sector, without visibly affecting our data on insured banks. (iii) Regulated commercial banks provide (at most) only one-third of the total credit to firms in the U.S. economy (Feldman and Lueck, 2007). Thus, the fact that we do not observe unusual distress in the regulated banking sector until 2008:Q4 does not imply that firms had easy access to credit in the previous quarters. (iv) Our measures of loan activity for 2008 may be affected by the programs implemented by the Treasury and the Federal Reserve and may have been very different without these interventions. (v) Although

we use comprehensive balance sheet data to determine measures of credit contraction and expansion, we may not account for cases where individual banks expanded and contracted within the same quarter nor have our basic measures taken into account loan commitments.[4] (vi) We try to document a series of facts, not explain them. Further research is necessary to understand the causes and consequences of such observations. In particular, it should be noted that we do not analyze the changes in the cost of borrowing, nor we are able to disentangle demand from supply effects.

II The Debate about the Evidence of a Credit Crunch

A vivid debate developed in the fall of 2008 about the evidence of a credit crunch in aggregate and disaggregate data. The first contribution to the debate was provided by Chari, Christiano, and Kehoe (2008, CKK henceforth) and used the H8 data from the Federal Reserve System that contain different categories of total assets and liabilities.[5] Total assets include (i) bank credit, (ii) interbank loans, (iii) cash assets, and (iv) other assets. Bank credit is the sum of securities (Treasury and agency securities, other securities) and loans and leases in bank credit. Loans and leases, the focus of our analysis in the next sections, is composed of C&I loans, real estate loans, consumer loans, security loans, and other loans and leases. CKK used the H8 data (available until October 15, 2008, at the time of the authors' writing) to discuss three "myths," or misconceptions, about lending during the crisis, specifically: "*(i) Bank lending to non-financial corporations and individuals has declined sharply. (ii) Interbank lending is essentially nonexistent. (iii) Commercial paper issuance by non-financial corporations has declined sharply, and rates have risen to unprecedented levels*" (CKK, p. 1).

CKK showed that the credit freeze was *not* evident in the aggregate data on commercial bank loans through October 15, 2008, and suggested that spreads are difficult to interpret in times of crisis because investors "fly to safety," that is, they rush to buy to Treasury bonds, whose real return accordingly falls. A plot of these weekly data for the period between January 1999 and February 2009 shows that the lack of a major credit contraction in aggregate data as pointed out in CKK extends to the end of 2008, although one can now observe a mild decrease of each type of loan in the fourth quarter. Most series appear to grow along a trend and then show a small decline in the last part of 2008 with two notable exceptions.[6] (i) The interbank lending series experienced a sharp drop between the end of September and early December before beginning to recover at the end of 2008; (ii) cash assets increased sharply in the fall of 2008 after staying basically flat (in nominal terms) until the end of 2008:Q3; they reached a level of more than $1 trillion at the end of 2008. Cash assets include deposits at the Federal Reserve Banks that have boomed since October 9, 2008, when the Federal Reserve System initiated interest payments on deposits at its Banks, as authorized by the Emergency Economic Stabilization Act.[7]

The original CKK paper triggered a reply by (Cohen-Cole, Duygan-Bump, Fillat, and Montoriol-Garriga, 2008, CDFM, henceforth) at the Boston Fed and a further Comment by Christiano (2008).[8] The gist of the CDFM reply is that (i) credit markets' troubles are evident in the data on spreads, (ii) a deeper look at disaggregated data shows evidence of the credit squeeze, and (iii) the increase in use of existing credit lines could explain part of the net credit growth. The authors suggest multiple reasons why aggregate data show no decline. (i) "Securitization" has basically disappeared and banks cannot repackage loans and

move them off their balance sheets. (ii) *New* lending may have collapsed while the use of loan commitments and lines of credit in the Call Reports appears to have increased to levels comparable to the Savings and Loan crisis of the early 1990s. (iii) There is clear evidence of cash hoarding by large banks.

A paper by Ivashina and Scharfstein (2010) provided further thoughts about the lending squeeze by showing that new syndicated loans to C&I companies dropped substantially during the financial crisis.[9] The amount of new loans to *large* borrowers in September through November 2008 ($233 billion) had fallen by 37 percent relative to June through August 2008 and by 68 percent relative to March through May 2007 ($726 billion), the peak of lending. New lending for capital expenditures fell to the same extent as new lending for restructuring (leveraged buy-outs, mergers and acquisitions, and share repurchases). The evidence based on syndicated loans also points to an increase in drawdowns of revolving credit facilities, particularly by low-credit-quality firms concerned about their access to funding. Therefore, *new* loans to large corporations steeply declined, particularly in October 2008.

In the next sections, we discuss some of the questions raised in those papers. We study the asset side of bank balance sheet data and focus on loans and leases to understand the underlying microeconomic determinants of the aggregate behavior emerging in the H8 data. The new evidence we provide is important for two reasons. First, we look at detailed micro data - namely, the *entire population of regulated U.S. commercial banks* - and *all types of loans*, not only syndicated loans. Second, we combine our series for the period between 1999 and 2008 with at least some of the series provided by Dell'Ariccia and Garibaldi (2005) and highlight the differences and analogies between the crisis and recession that began in 2007

and previous recessions.

III Data and Methodology

The first data source we use is the publicly available Reports of Condition and Income database (commonly called Call Report Files).[10] These files contain quarterly bank-level balance sheet information for all banks regulated by the Federal Reserve System, Federal Deposit Insurance Corporation, and the Comptroller of the Currency. In this dataset, banks report their individual-entity lending activities on a consolidated basis for the entire group of banks owned by the reporting entity. We used the data available at the time of this writing covering the quarters between 1999:Q1 and 2008:Q4 and encompassing the 2001 recession and the start of the recession that began in December 2007. The number of banks filing Call Reports fell from 14,949 in 1979 to 9,639 in 1998 but thereafter decreased by a much smaller fraction to about 8,000 entities 10 years later. We observe 7,944 banks in the last quarter of data we use. In order to take into account consolidation, entry, and exit that took place during the quarters covered by our sample in our analysis, we match the Call Report data with the National Information Center's (NIC) transformation table available from the Board of Governors of the Federal Reserve System.[11] We also need to account for several problems generated by commercial banks' acquisition of financial institutions that do not file Call Reports. (See the end of this section.)

Following Dell'Ariccia and Garibaldi (2005), we create two measures of credit expansion and contraction that we further use to determine measures of gross flows, net flows, and credit reallocation in excess of net credit changes. The two measures are called *nominal* and

idiosyncratic. In the rest of this section, we describe the computation of these measures.

For each bank i and period t, $l_{i,t}$ is the value of nominal loans in one quarter and $\Delta l_{i,t} = l_{i,t} - l_{i,t-1}$ is the change in total loans. From this baseline definition, we make adjustments to take into account mergers and acquisitions as well as failures.

We define "loan creation" as the sum of the change in bank loans at all banks that increased their loans since the previous quarter; we define "loan destruction" as the absolute value of the decrease in loans at all banks that decreased their loans since the previous quarter. In other words, a bank expands credit in a given period if its credit growth is positive and contracts credit in a given period if its credit growth is negative. Then "gross flows" is the sum of creation and destruction (whereas "net flows" is the difference between the two). In order to aggregate our data from individual bank Call Reports, we need to correct loan flows for mergers and acquisitions; otherwise our aggregate will be subject to double counting. For example, if bank i (the surviving bank) acquires bank j (the non-surviving bank) in period t, then the loan portfolio for bank j is zero or $l_{j,t} = 0$, while the loan portfolio for the surviving bank includes the previous balances of the acquired bank plus its net loan changes, or $\Delta l_{i,t} = l_{i,t-1} + \Delta l_{i,t} + l_{j,t-1} + \Delta l_{j,t-1}$. Thus, we need to adjust the change in bank $i's$ loans by subtracting the loans of bank j in $t-1$ from the change in bank $i's$ loans and add them to the difference for bank j. The adjusted change in the loan portfolios should then be $\Delta \tilde{l}_{i,t} = \Delta l_{i,t} - \sum_{k=1}^{N} \phi_{ik}(t) l_{k,t-1} - \psi_i(t) \Delta l_{i,t}$, where $\phi_{ik}(t)$ is an indicator function that takes a value of 1 if bank i acquires bank k at some s between $t-1$ and t and the value 0 otherwise. Thus, if bank k is acquired by bank i, its loans from the previous period are subtracted from the raw change in bank $i's$ loan portfolio. Similarly, $\psi_i(t)$ is an indicator function that is

equal to 1 if bank i is itself acquired (by some other bank) between period $t-1$ and t. Thus, we keep the changes in an acquired bank's loan portfolio with the acquired bank for the period of acquisition and remove them from the acquiring bank. There are two exceptions to this rule: If the non-surviving bank was divided among several banks, unless we could otherwise determine what share of the loans the acquiring banks received, we divided the changes in lending of the acquired bank by the number of acquiring banks and removed part of the new credit from each of the acquiring banks. The other exception is if the original bank survives the merger or acquisition (keeps its own charter); in that case, we leave all the changes in credit with the original bank and none with the newly formed bank or banks.

We used data from the NIC to identify when banks experienced a transformation - for example, a merger or acquisition (either as the acquirer or acquiree) with discontinuation of one of the involved bank's charter, a split, sale of assets, or merger without a charter discontinuation or a failure. These data were matched with Call Report data on bank balance sheets and used to adjust loan totals (and subcategories of loans). In our 40 quarters of data, there were roughly 2,335 mergers and acquisitions where the acquired bank's charter was discontinued, and 126 failures where the non-surviving bank's assets were apportioned to other banks and regulator agencies and the non-surviving bank's charter was discontinued. Notably, for the period between 1999:Q1 and 2008:Q4, 42 of 126 failures occurred in 2008 and 16 in the fourth quarter of 2008. If we exclude data from the third and fourth quarter of 2008, bank failures average less than 1 per quarter (0.63). Including the failures through the end of 2008 roughly doubles this figure. We adjusted the balance sheet data to take into consideration the two cases where one of the banks involved in a transformation (an

acquisition, merger, or failure) lost its charter. Consistent with Dell'Ariccia and Garibaldi (2005), we ignored instances where banks transferred assets to other banks but retained their charter.

During 2008 various financial institutions began to file Call Reports, either because they acquired a charter (Goldman Sachs, Morgan Stanley, Merrill Lynch, and American Express) or because they were acquired by regulated commercial banks. Although our adjustment procedure treats the acquisition of commercial banks by other commercial banks (for example, the acquisition of Wachovia by Wells Fargo[12]) very smoothly, acquisition of financial entities that did not previously file Call Reports must be treated with special care. In particular, the acquisition of Washington Mutual (WaMu) by JPMorgan Chase on September 26, 2008, creates a non-trivial problem for our data because the size of these banks' loans potentially biases our growth measures if we do not account for them properly. Specifically, WaMu was a "thrift" until the acquisition and, as such, filed Thrift Reports with the Office of Thrift Supervision until 2008:Q2.[13] With the acquisition by JPMorgan Chase, all loans on the asset side of WaMu's balance sheet were reported in the Call Report of JPMorgan Chase in 2008:Q3. Therefore, we are forced to amend our methodology to account for this event, which would otherwise significantly distort our measures of loan expansion and contraction in 2008:Q3 and 2008:Q4. We use two ad hoc procedures: (i) We construct an additional set of contraction and extraction series by excluding WaMu and JPMorgan Chase for the entire sample we study; and (ii) we modify the series of loans reported by JPMorgan Chase by including WaMu's Thrift Reports for the entire period for which they are available on the website of the Federal Financial Institutions Examination Council (i.e., 2001:Q1-2008:Q2),

and then using the Call Reports of JPMorgan Chase for 2008:Q3 and 2008:Q4 when they include the loans made by WaMu.[14]

Another important issue we face with the economic interpretation of the data is that we cannot distinguish between two different events that can cause credit to contract: loan write-offs for failed and defaulted loans or loans that are not rolled over upon expiry. To the extent that different mechanisms are involved in these two types of credit contraction, our analysis is not able to distinguish between them.[15]

We reconstruct the gross flows, step by step, using the following procedure: (i) We first compute *adjusted credit growth rates* $\tilde{g}_{it}$, defined as $\tilde{g}_{it} = \Delta\tilde{l}_{it}/[0.5 * (l_{it-1} + l_{it})]$, i.e., the ratio between the adjusted change in total loans between t and $t-1$, $\Delta\tilde{l}_{it}$, and the average value of loans between t and $t-1$, a variable that bounds the adjusted credit growth rate between -2 and +2. Naturally $\tilde{g}_{it}$ is positive for the generic bank i if it has expanded loans between t and $t-1$ and is negative in the opposite case. (ii) We then aggregate individual adjusted growth rates over the share of the population of banks for which $\tilde{g}_{it}$ is positive, as follows: $POS_t = \Sigma^N_{i|\tilde{g}_{it}\geq 0}\tilde{g}_{it}[0.5 * (l_{it-1} + l_{it})/\Sigma^N_{i=1}l_{it-1}]=\Sigma^N_{i|\Delta\tilde{l}_{it}\geq 0}\Delta\tilde{l}_{it}/\Sigma^N_{i=1}l_{it-1}$. We calculate a similar measure for banks for which we observe a decrease in loans $\tilde{g}_{it} < 0$, $NEG_t = \Sigma^N_{i|\tilde{g}_{it}<0}|\tilde{g}_{it}|[0.5 * (l_{it-1} + l_{it})/\Sigma^N_{i=1}l_{it-1}]=\Sigma^N_{i|\Delta\tilde{l}_{it}<0}\Delta\tilde{l}_{it}/\Sigma^N_{i=1}l_{it-1}$. (iii) With these two measures of credit expansion (POS_t) and credit contraction (NEG_t), we can define the net growth rate of credit as their difference, $NET_t = POS_t - NEG_t$ and a measure of reallocation in excess of the net credit change $EXC_t = POS_t + NEG_t - |NET_t|$. We will use these measures to discuss *nominal flows*.

We then construct measures of *idiosyncratic loan flows* that compare individual loan changes

to an aggregate economy-wide trend (i.e., the trend component of the Hodrick-Prescott filtered growth rate of aggregate loans, with a parameter of 1600 for quarterly data).[16] The idiosyncratic growth rate of a bank-specific flow $\widehat{g}_{it}$ is then given by $\widehat{g}_{it} = \tilde{g}_{it} - g_t^{HP}$ (i.e., the difference between the adjusted measure $\tilde{g}_{it}$ and the trend of aggregate credit growth g_t^{HP}). Similar to the case of nominal flows, we can define the net growth rate relative to trend as $\widehat{NET}_t = \widehat{POS}_t - \widehat{NEG}_t$, and a measure of aggregate expansion and contraction relative to trend growth as $\widehat{SUM}_t = \widehat{POS}_t + \widehat{NEG}_t$.

Finally, the series that include WaMu's loans between 2001:Q1 and 2008:Q4 are called POS_t^+, NEG_t^+, $\widehat{POS}_t^+$, and $\widehat{NEG}_t^+$; the series that exclude JPMorgan Chase between 1998:Q1 and 2008:Q4 are plotted as POS_t^-, NEG_t^-, $\widehat{POS}_t^-$, and $\widehat{NEG}_t^-$. The series including WaMu and excluding JPMorgan Chase are plotted only for the recession that began in 2007.[17]

IV Results: 1999-2008

Nominal and Idiosyncratic Gross Credit Flows

Credit expansion and contraction series are plotted in Figure 5 for our measures for total loans between 1979 and 2008, in Figure 2 for total loans and loans by type between 1999 and 2008, and in Figure 3 for total loans by bank size. All these figures plot the nominal series in the graphs at the top of the figure and the idiosyncratic series in the graphs at the bottom. We also plot the same measures calculated to include WaMu (POS_t^+, NEG_t^+, $\widehat{POS}_t^+$, and $\widehat{NEG}_t^+$) during the quarters of the recession that began in 2007 and again the same measures calculated to exclude WaMu and JPMorgan Chase (POS_t^-, NEG_t^-, $\widehat{POS}_t^-$, and $\widehat{NEG}_t^-$) during the same period. Although the series follow similar patterns, some minor

discrepancies appear.

Observing our nominal series from a historical perspective shows, first, that there are significant gross flows at any point of the cycle in any of these series, either total loans or loans disaggregated by type, state, and bank size. Second, credit expansion in the past 10 years is larger in magnitude and more volatile than in the previous 20 years while credit contraction has a similar volatility and average over our sample as in the previous 20 years. Third, the coexistence of expansions and contractions in lending growth are observable across loan types, bank sizes, and U.S. states. (See online appendix.) These observations suggest that the large gross flows we observe at the aggregate level do not mainly reflect portfolio reallocation (e.g., increasing specialization) because we also find that sizeable flows exist within each category of loans. Moreover, the figures show that large gross flows exist for banks of all sizes, so the aggregate flows do not merely reflect the heterogeneous behavior of banks of different sizes.

The idiosyncratic growth rates for the 1979-99 period follow patterns similar to the growth of nominal flows, but some differences emerge in the estimated series for total loans for the most recent period (compare the top and the bottom graphs in Figure 5). However, the interpretation of the idiosyncratic flows is somewhat different because these series take into account the fact that aggregate credit is growing along a trend. The idiosyncratic flows also better display the heterogeneous behavior of individual banks' loan decisions. In Table 1 we find that gross flows are sizeable even as a deviation from trend. Idiosyncratic credit expansion and contraction are roughly balanced at approximately 2.7 percent (credit contraction is slightly larger than expansion), which is 0.6 percent larger than in the period

1979:Q2-1999:Q2. This means that a significant number of banks expand and contract credit in excess of trend credit growth. We also find that credit expansion is more volatile than credit contraction. We find a 13 percent larger coefficient of variation for credit expansion (0.36) than Dell'Ariccia and Garibaldi (2005), who calculated a coefficient of variation of 0.32 for aggregate flows from 1979 to 1999 and the same coefficient of variation for credit contraction of 0.42. This confirms the asymmetry in the composition of gross flows.

Types of Loans. In Figure 2 we plot total loans and three types of loans - namely, real estate loans, C&I loans, and loans to individuals.

The first of the four graphs shows how net credit has expanded continuously between the 2001 and the 2008 recessions. The lack of noticeable credit contraction until October 2008 plotted in Chari, Christiano, and Kehoe (2008) is evident also in our constructed series based on micro data, at least until the end of September 2008. Total credit expansion by U.S. commercial banks was flat during the first three quarters of 2008 when credit contraction was increasing for all types of loans. Hence, if signs of distress were present in this segment of the banking sector, they do not appear in our estimated series, except for suggesting lower-than-average expansion. With only these series based on extended loans at hand, we would not be able to single out a credit crisis episode in 2007-2008, as other periods show similar patterns (for example, the 2001 recession; see Figure 5). The fourth quarter of data, however, changes the picture: The steep increase of credit contraction combined with a further decline of credit expansion for total loans displays a pattern that is similar only to the 1990-91 recession when compared to recessions over the past three decades. These years also witnessed the peak of the Savings and Loan crisis with about 1,000 thrift failures, of

which 675 occurred between 1989 and 1991 (Curry and Shibut, 2000).

The summary statistics in Table 1 also show that gross flows are significantly larger than net flows during the period we study. Average quarterly net credit growth of 3.1 percent is due to an increase of 4.4 percent in expansion and an increase of 1.3 percent in credit contraction, consistent with Dell'Ariccia and Garibaldi (2005). We find that excess credit reallocation is 2.6 percent per quarter (i.e., approximately $158 billion is reallocated on average each quarter, based on average quarterly loan flows of $5.3 trillion).

Types of loans. During the current recession, the three types of loans also show a pattern similar to the pattern of total loans during the early 1990s recession, with some nuances. Because the value of real estate loans averages 51 percent of the value of total loans granted by banks in the Call Report data between 2001 and 2008, real estate loans clearly play a major role in the evolution of the expansion and contraction series for total loans.

The time series for individual loans and C&I loans are remarkably similar to the series for real estate loans. However, the series for individual loans are generally more volatile (descriptive statistics are reported in Table 1), and we observe various instances during which net flows did not grow during the 1999-2008 period; this is the outcome of a large credit contraction observation matched by an equally large credit expansion observation. More recently, individual credit has expanded more than it has contracted, except for 2008:Q4 when despite negative net growth, both expansion and contraction increased steeply. The series for C&I loans are relatively less volatile than for real estate or individual loans and show clearly that the impact of the 2001 recession continued well into 2003-04. After this period, credit appears to have expanded vigorously until the 2008 slowdown. Notice also that

the correlations with the cyclical component of GDP for C&I flows are the highest among various types of flows (Table 2). Our series show lower expansion and larger contraction in the first three quarters of 2008, but the net effect implies a positive net credit expansion. Unlike the data from the 2001 recession, the Call Report data at this point do not show clear signs of distress in the C&I loan segment of the banking industry, at least through the end of September 2008. The measures for 2008:Q4, as in the case of total loans and real estate loans, show a steep increase in contraction paired with a decrease in expansion.

One of the reasons real estate loans did not contract until the fourth quarter of 2008 is the sharp decrease in the cost of refinancing mortgages. We collected the Mortgage Bankers Association (MBA) weekly indices of refinancing and purchasing along with the Federal Home Loan Mortgage Corporation (Freddy Mac) average fixed rate for 30-year mortgages, and normalized the index to 100 at the end of 2007. The unconditional correlation between the MBA refinancing indices and the average fixed rate is -0.90, while the correlation between the normalized MBA purchasing rate and the average fixed rate is -0.20. These correlations indicate that falling rates on mortgages may have triggered a wave of refinancing, which manifested itself as net growth of real estate loans in our 2008:Q3 observation. However, these are only correlations and should not be interpreted as causative as we provide no formal proof.

Bank Size. Since much of the aggregate character of loans is determined by the largest banks, we investigated whether the patterns we observe across all banks change if we segregate banks into groups by size. Figure 3 shows the behavior of nominal credit expansion and contraction for banks in the top 10 percent, top 25 percent, or bottom 75 percent ranked

by the value of total loans of the bank in 2007:Q1. We find that the volatility in credit expansion is largely driven by banks in the top decile of banks by size, while the banks in the lower three quartiles had much smoother patterns of credit expansion, though their credit contraction was slightly more volatile. Large idiosyncratic gross credit flows coexist within each bank size decile and these flows increased in our sample compared with those in the previous two decades. When measuring gross flows as the sum of idiosyncratic expansions and contractions, $\widehat{SUM}$, by bank size decile, we find that $\widehat{SUM}$ is 3.5 percent for the first (lowest) decile and 4.2 percent for the 10th or highest decile.[18] Thus, a significant amount of heterogeneity exists even among banks of the same size. We also find that a significant amount of the volatility of idiosyncratic credit expansion is driven by the lending behavior of banks in the top quartile (see Figure 3), while the behavior of idiosyncratic credit contraction is much more similar across banks in all quantiles. Interestingly, we find that for relatively smaller banks (those in the lower 75 percentile of the distribution), the increase in idiosyncratic credit contraction following the 2001 recession was large enough to lead to a net credit contraction (among these banks) even though idiosyncratic credit expansion was about average at the time.

Looking at the current recession, we find that idiosyncratic contraction among the smaller banks is small and not markedly increasing through the fourth quarter of 2008, whereas contraction rose between the first and last quarters of 2008 among banks in both the top 10 and top 25 percentiles of the distribution. The changes in idiosyncratic expansion during 2008 were also driven by banks in the top quartile, with a marked increase in contraction during the fourth quarter of 2008 for these banks. Overall, the number of banks that contracted

credit between the third and fourth quarters of 2008 actually increased. This behavior does not match that of the 2001 recession, when the behavior of credit expansion and contraction among smaller banks was similar to the behavior observed in larger banks.

The most interesting result from the breakdown by size is that the relatively smaller banks show little impact from the recession that began in 2007. Their credit growth was positive and comparable to, if not larger, than previous years. Naturally, because the larger banks control a disproportionately larger share of loans, the behavior of gross flows in the top decile and top quartile of the distribution drives the behavior of total loans.

The Role of Unused Commitments

Although the volume of loans did not contract until the fourth quarter of 2008, credit expansion was at best weak during the previous three quarters (see Figure 2). The decline of syndicated lending - the primary source of credit for large corporations - began in mid-2007 and accelerated as the crisis grew. However, many of these loans to large corporations are not held in the commercial banking sector and so are not reported in the Call Reports. We offer two ideas, suggested by anecdotal evidence, that might explain the lack of significant contraction. First, it is possible that firms and commercial businesses face difficulties in other credit markets, particularly in the market for commercial paper issued by non-financial corporations as well as in bond issues. Second, it is possible that firms are drawing from existing lines of credit available at commercial banks but these banks may not be granting new loans. Thus, the dramatic decline in syndicated bank lending may have prompted firms to tap into unused credit at commercial banks to a greater degree. This is consistent with Figure 4, which shows that total unused loan commitments of various types and maturities

peaked in the second half of 2007 and have since declined through the fourth quarter of 2008, with a steep 17 percent drop by the end of 2008 (previously, the rate of decline had been approximately 1.5 percent per quarter). Considering the ratio of unused commitments to total loans, we find that the peak in this ratio occurred much earlier, in the first quarter of 2002, and the ratio has since steadily declined. The decline in this ratio could be due to one or both of two factors: a decrease in new commitments or an increase in total loans taken under preexisting commitments. Since unused commitments peak much later, it seems clear that the decline in the ratio of commitments to loans is due to the increase in total loans at least through the second half of 2007 rather than a reduction in unused commitments. The reduction in unused commitments was led by a steep fourth-quarter decline in credit card lines as well as continuing declines in unused credit lines to firms (both secured by real estate and unsecured). Home equity credit lines also decreased by 4 percent after increasing by 3 percent in the third quarter. The ratio of other unused commitments (credit lines to firms) to C&I loans increased in the fourth quarter, in this case driven by the steep decline in C&I loans. This observation is consistent with the fact that commercial lending is strongly procyclical.

Hence, the Call Report data indeed suggest that there has been an increase in the use of credit lines available for C&I loans. Now, if this increased drawdown of unused commitments signals difficulty in securing credit elsewhere, excess available credit may be working as insurance (or backup credit) for firms (Morgan, 1998).

Demand, Supply, and the Senior Loan Officer Survey

Our flow measures provide no information whether banks are tightening credit standards or

whether borrowers are demanding less credit - that is, whether the decrease in the volume of loans comes from reduced demand by households and firms or from a credit squeeze on the supply side. A look at aggregate data from the H8 release reveals a small decrease in credit that appears to be consistent with the decreases observed during previous recessions, and certainly with the 2001 recession. It should be kept in mind that the U.S. Treasury and the Federal Reserve System have created and implemented many new programs aimed at supporting financial intermediation after September 2008 and these programs are expected to affect commercial bank lending.

Although establishing whether a decrease in loans is due to lower demand or to a credit squeeze is difficult, some insight may be gained from a survey of senior loan officers at major banks across the nation carried out by the Federal Reserve System on a quarterly basis, the Senior Loan Officer Survey on Bank Lending Practices, publicly available on the website of the Board of Governors.[19] The survey asks senior loan officers for their perceptions about the supply and demand side of various types of loans - namely, C&I loans extended to large, medium, and small firms and mortgage and consumer loans. The series are the net percentage of officers of domestic banks who responded that they see tightening standards for these types of loans and the net percentage of officers reporting stronger demand for a specific type of loan, for example, mortgage loans. In the case of the current recession, the net percentage of respondents reporting stronger demand for loans has fallen to levels comparable to those observed during the 2001 recession for commercial real estate and by much less for other loans requested by all sizes of firms. Hence, to this point, the demand for loans would appear to have weakened to levels comparable to the previous recession.

However, as these are relative measures, all we can say with certainty is that demand has fallen and it is unclear how comparable the depth of the fall is between the two recession. A similar trend can be observed for mortgage and consumer loans, with the latter faring particularly poorly and mirroring the drop in aggregate consumption in the second part of 2008. The net percentage of respondents reporting tightening standards has increased for several quarters in 2007/8, to levels similar to those observed in the 1991 recession, and even higher levels for mortgage and consumers loans, for which the series reached a historical high in 2008:Q4. Again, to be strictly correct, all we can say is that lending standards are tightened. We cannot conclusively compare the tightness in standards during this recession and previous ones. These five measures show some improvement in the latest survey available at the time of this writing administered in January/February 2009. Therefore, the Survey seems to suggest not only that banks are tightening standards, possibly screening applicants with more effort than previously, but also that the effects of the recession are being observed in the demand for loans.

Cyclical Properties

We describe the cyclical properties of gross flows in Table 2 (series in levels). Aggregate flows are more volatile than GDP, but not nearly as volatile as they were in the previous 20 years. Expansions are about as volatile as contractions, not only for aggregate loans but also for individual loans. The volatility of the contraction series for C&I loans and real estate loans is larger than that of expansion. However, our volatility findings may be due to our relatively short time series (for purposes of considering cyclical properties) and the fact that it includes only one full recession (2001) and the beginning of the current recession, so we

interpret them cautiously.

From Table 2, we find that credit expansion in total loans is procyclical (with GDP), contraction is countercyclical, and excess reallocation of credit is countercyclical. The cyclical behavior of the components of aggregate flows follows distinct sectoral patterns. C&I loan expansion and contraction displays cyclical behavior similar to that of aggregate loans, although the correlation with GDP is much higher. Real estate loans show lower contemporaneous correlations with GDP, while individual loans exhibit much lower correlations with the cyclical component of GDP and excess reallocation is procyclical. It appears that the asymmetry in the behavior of contractions and expansions comes from adjustment within individual banks and loan categories rather than aggregate shocks. In general, it is more difficult for banks to adjust to a positive shock quickly. We see anecdotal evidence of the length of this adjustment process in the current recession when banks are being pressured to expand lending quickly. Conversely, it is relatively easier to reduce credit in response to a negative shock as banks can refuse to roll over debt, reduce credit lines, and place stricter conditions on new loans. The differences in the volatility of expansion and contraction may be related to these supply side considerations, though we offer no formal proof here. The relation to the demand side is not as clear.

Comparison of Different Recessions

We examine the behavior of gross credit flows for five recessions, two from our sample data and three from the Dell'Ariccia and Garibaldi (2005) sample. We show that credit contraction tends to increase during recessions while credit expansion decreases. For the overall U.S. economy, our estimates show a cross-sectional reduction of net credit only in

rare occasions, most notably during and after the 1991 recession, an occasion that was related to the severity of the Savings and Loan crisis. However, the typical pattern of other recessions, including the recession that began in 2007 through the third quarter of 2008, is a drop of credit expansion and a sharp increase in credit contraction, but which generally leaves net flow growth positive although small.

Gross bank loan flows behaved similarly over three of the past five recessions (1980, 1981-82, and 2001). During the 1991 recession gross bank flows behaved quite differently. The *start* of the current recession appears very similar to the 1980 and 2001 recessions, but adding data for 2008:Q4 makes the pattern more similar to the beginning of the 1990-91 recession (see Figure 5). In the 1980 and 1981-82 recessions, net credit followed a "V"- shaped pattern, with credit expansion falling quickly below trend just before and during the recession and rebounding sharply immediately following the trough in economic activity; credit contraction followed the opposite pattern, rising quickly above trend and falling sharply after the trough. In general, the drop in credit expansion and the rise in credit contraction exhibited little persistence in these two recessions. In the 1991 recession, however, the decline in credit expansion and the increase in contraction were persistent, lasting for two years into the recovery (there was also a fair amount of persistence of low expansion and high contraction following the 2001 recession). In part, this was due to the Savings and Loan crisis, which began roughly five years before the 1991 recession and was not fully resolved for four years after the recession. During this crisis, over 1,000 U.S. thrift institutions with combined assets of over $500 billion in current dollars failed (see Curry and Shibut, 2000). In the 1991 recession, the increase in credit contraction accounted for approximately 50 percent of the

reduction in net credit, while in previous recessions credit contraction displayed little change in absolute terms.

In Figure 5 we plot the cyclical components of the levels of credit expansion and credit contraction around NBER-dated recessions. Qualitatively, the cyclical behavior of the credit expansion series during the recession that began in 2007 (darker line) appears remarkably similar to those of the 1981-82 and 1990-91 recessions. During the Savings and Loan crisis (which ended in 1994), the negative cyclical component of the credit expansion series was large and highly persistent for many quarters after the end of the recession, as was the positive cyclical component of the credit contraction series. At the time, the increase in credit contraction accounted for most of the negative change in net credit, generating a so-called creditless recovery. Conversely, the cyclical components of the contraction and the expansion series around the 2001 recession display a profile that looks more similar to that of the 1980 recession, when the cyclical component of contraction was above that of expansion only for four quarters.

During the 1991 recession, there was also a large and persistent increase in excess credit reallocation of up to 4.2 percent at the time of the trough in economic activity (1991:Q1), which remained in the 4 percent range through 1992. The persistent aggregate excess reallocation during the 1991 recession may have been driven by changes in the regulatory and market structure of the banking system. During the 2001 recession, by contrast, excess credit reallocation was as high as 6.2 percent at the trough in economic activity (2001:Q4), but it returned to its average in 2002:Q3. So far, in the recession that started in 2007:Q4, excess credit reallocation is slightly above average (but not as high as during the 2001 recession).

It is possible that further quarterly data will reveal a creditless recovery similar to that following the Savings and Loan crisis.

V Conclusions

In this paper, we described gross credit loans of U.S. commercial banks between the first quarter of 1999 and the fourth quarter of 2008. We compared our measures with the evidence for previous years and found that the credit expansion series is substantially more volatile than it was before 1999, while the credit contraction series is remarkably similar. We found that excess credit reallocation remains significant at around 3 percent of total quarterly loans, implying significant informational costs. We also found that individual and real estate loans had similar cyclical properties but differed from the properties of total loans, while commercial loan behavior was similar to that of total loans. Significant heterogeneity among banks of different sizes and across U.S. states continues to persist, while regional trends in loan expansion and contraction may be increasingly significant at the aggregate level.

Regarding the financial crisis that began in 2007, we described the evolution of bank lending to understand why the behavior of total loans and the components of total loans show little sign of distress in the first three quarters of 2008. Real estate, individual, and commercial loans expanded between the first and third quarters of 2008, albeit at a rate that was below trend. However, the fourth quarter marks the beginning of a credit contraction similar to one that occurred during the 1990-91 recession and the peak of the Savings and Loan crisis. Our results also help to reconcile the arguments made in CCK (2008) and CDFM (2008). They are consistent with the first paper because our measures show that no evidence of

the credit crunch was visible in the data on the quantity of loans extended by commercial banks, at the time of those authors' writing. With only series that measure quantities at hand through the third quarter of 2008, we would not have been able to single out a credit contraction episode. Moreover, our results provide support to the second paper's argument because the larger use of credit commitments appears to have postponed the contraction of net lending to the last quarter of 2008. Future data will reveal new important information on the extent and the persistence of the contraction, and perhaps on the effect of some of the new programs implemented by the Treasury and the Federal Reserve to ease credit conditions in this segment of the credit market.

At this time, credit expansion and contraction behavior looks very similar to the pattern of credit during the recession of 1990-91 that also witnessed the peak of the Savings and Loan crisis. We observe a contraction in net credit only at the end of 2008, while credit expansion remains below trend and contraction is above trend. It remains to be seen whether net commercial banks credit will contract throughout the current recession or will start expanding again in the first quarter of 2009.

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Notes

[1]Our approach to describe gross loan flows mirrors the approach to gross job flow dynamics popularized by Davis, Haltiwanger, and Schuh (1996). According to this literature, *net employment changes* in the overall economy can be computed as the difference between *gross job creation* by firms which expand employment, and *gross job destruction* by firms which reduce employment.

[2]For a study of the determinants of bank failures and acquisitions in the United States, see Wheelock and Wilson (2000).

[3]Our raw data for 2008 include four financial entities that acquired charters as commercial banks and are now filing Call Reports, namely, Goldman Sachs, Morgan Stanley, Merrill Lynch, and American Express. We excluded these entities for the purpose of this paper to maintain comparability with earlier periods. When we include these four newly chartered entities, the only difference is that credit contraction is slightly larger in 2008:Q3. Instead, the acquisition of Washington Mutual by JPMorgan Chase in 2008:Q3 requires particular care for reasons that we explain in detail in Section 3.

[4]We take loan commitments into consideration in determining to what extent the crisis was fueled by demand versus supply side considerations in Section IV.

[5]http://www.federalreserve.gov/releases/h8/data.htm.

[6]See online appendix at http://research.stlouisfed.org/wp/more/2009-011/.

[7]See Anderson (2008) for details about this program.

[8]We refer the interested reader to these papers for precise details about the debate. These papers make several other interesting points that we omit simply because they are less relevant for our analysis.

[9]Syndicated loans made to large companies are loans originated by large banks and then sold by the originator to a syndicate of financial institutions, including those who structure collateralized debt obligations.

[10]http://www.chicagofed.org/economic_research_and_data/commercial_bank_data.cfm.

[11]Similar information is publicly available in the Bank Holding Company Data (http://www.chicagofed.org/economic_research_and_data/bhc_data.cfm) available at the Chicago Fed website.

[12]Note that Citigroup initially stepped forward to purchase Wachovia, but that takeover was aborted on Oct. 9, 2008, when Wells Fargo staked its claim.

[13]A thrift is a financial institution whose activity focuses on taking deposits and originating home mortgages.

[14]https://cdr.ffiec.gov/public/ManageFacsimiles.aspx.

[15]For an analysis of the bank practice of lending to insolvent firms in Japan, see Caballero, Hoshi, and Kashyap (2008).

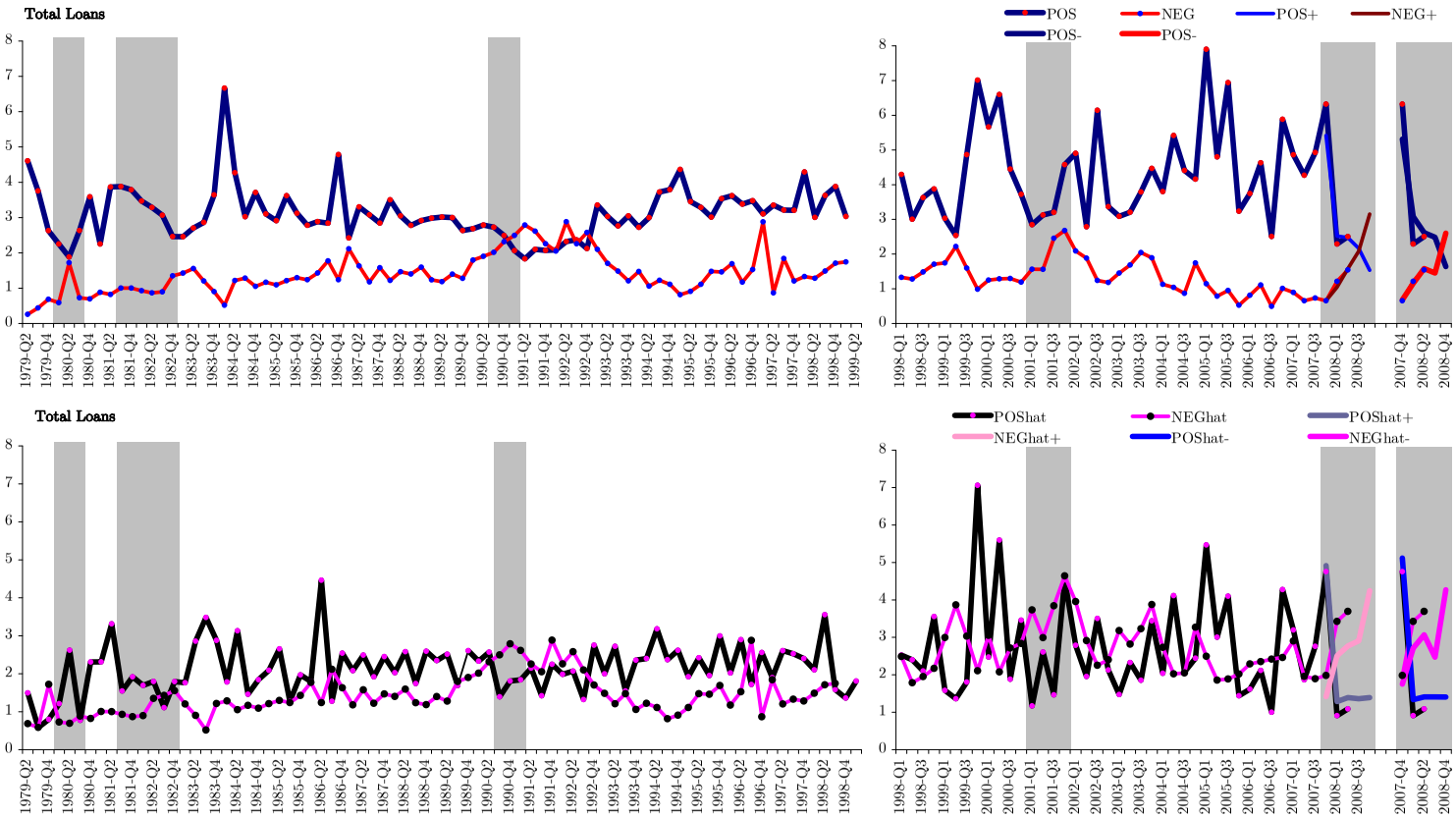
[16]We calculate idiosyncratic loan flows for consistency with the data series calculated by Dell'Ariccia and Garibaldi (2005). Our tests show that the growth rates of credit are trend stationary and therefore Hodrik-Prescott filtering is appropriate.

[17]The entire series are available from the authors. The patterns are remarkably similar to the un-amended series that can be reconstructed until 2008:Q2.

[18]Comparatively, Dell'Ariccia and Garibaldi (2005) find $\widehat{SUM}$ is 7.4 percent for the first decile and 4.5 percent for the 10th decile.

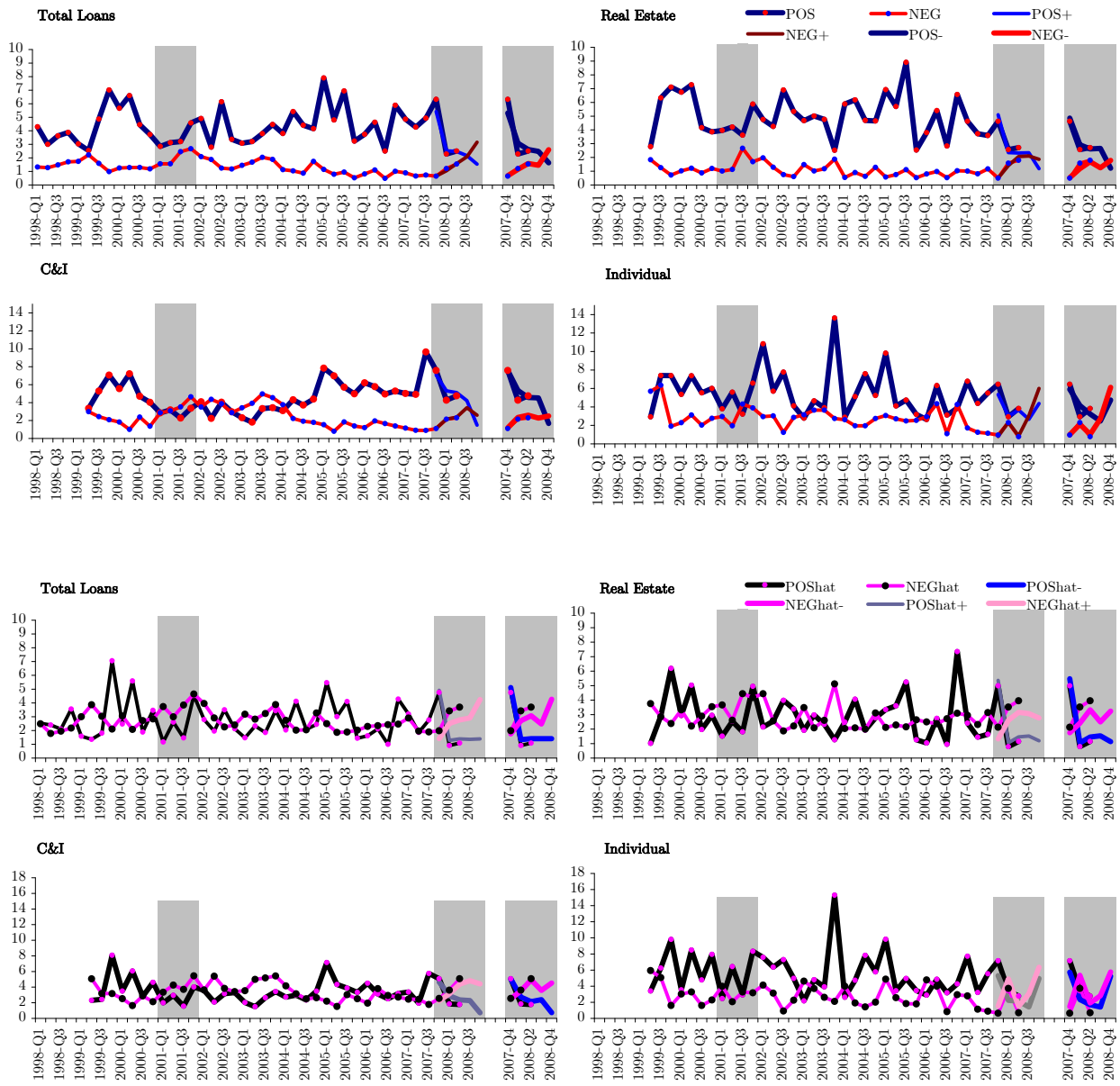
[19]http://www.federalreserve.gov/boarddocs/snloansurvey/.

Figure 1: Nominal and Idiosyncratic Gross Credit Flows for Total Loans (1979:Q1-2008:Q4)



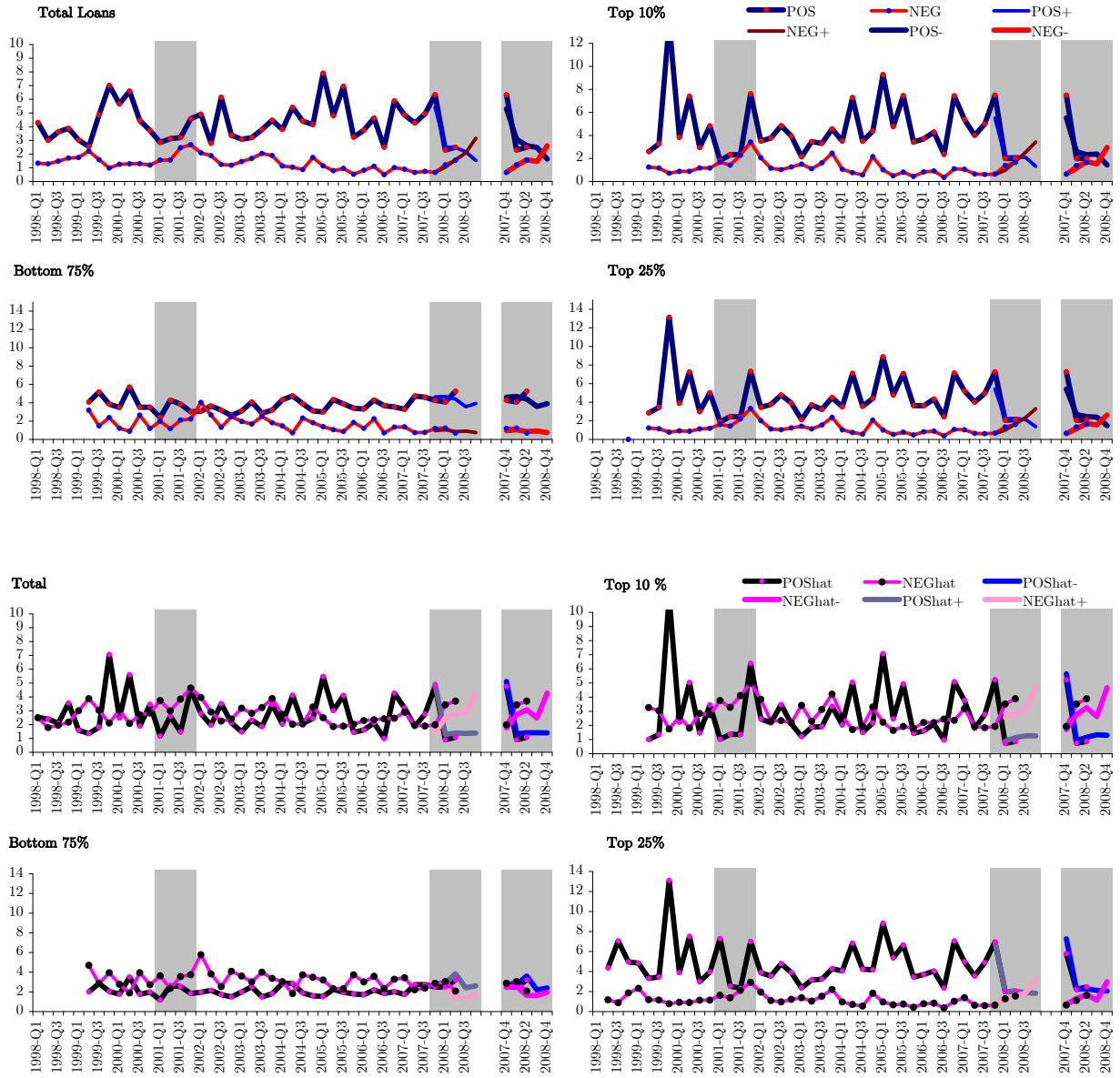
Note: The series from 1979 to 1999 are from Dell'Ariccia and Garibaldi (2005), the series from 1999 to 2008 are based on authors' calculations. The entire series and their plots are available from the authors. POS_t^+, NEG_t^+, $\widehat{POS}_t^+$, and $\widehat{NEG}_t^+$ include WaMu's loans. POS_t^-, NEG_t^-, $\widehat{POS}_t^-$, and $\widehat{NEG}_t^-$ exclude JPMorgan Chase. These series are plotted only for the recession that began in 2007. The top two figures are quarterly nominal gross flows, the bottom two are quarterly idiosyncratic flows. Shaded areas represent NBER recession quarters. The thicker line represents a measure of credit expansion that can be approximately interpreted as the weighted growth rate of loans for institutions that increased lending between any two quarters. The thinner line represents a measure of credit contraction that can be approximately interpreted as the weighted growth rate of loans for institutions that reduced lending between any two quarters. The weights are the ratio between the value of credit extended by each bank and total aggregate lending. The measures of idiosyncratic flows are computed similarly, but after subtracting the trend of the growth rate of aggregate lending from individual growth rates.

Figure 2: Nominal and Idiosyncratic Gross Credit Flows for Total Loans and "Types of Loans" (1998:Q1-2008:Q4)



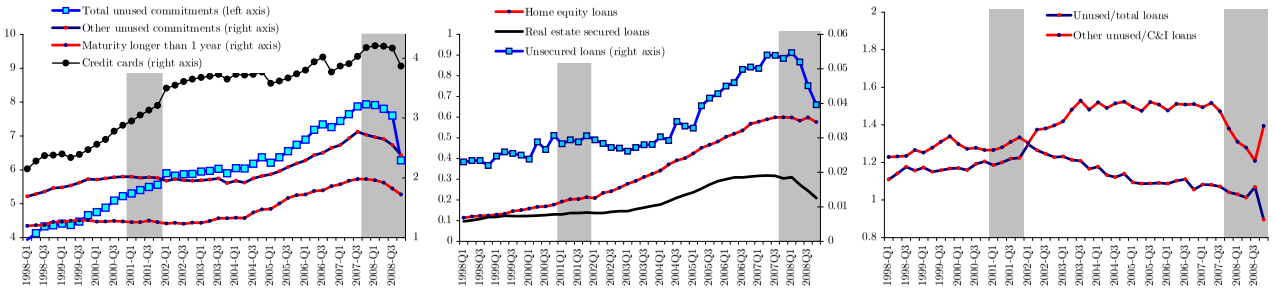
Note: Authors' calculations. POS_t^+, NEG_t^+, $\widehat{POS}_t^+$, and $\widehat{NEG}_t^+$ include WaMu's loans. POS_t^-, NEG_t^-, $\widehat{POS}_t^-$, and $\widehat{NEG}_t^-$ exclude JPMorgan Chase. These series are plotted only for the recession that began in 2007. The entire series and their plots are available from the authors. The top four figures are quarterly nominal gross flows, the bottom four are quarterly idiosyncratic flows. Shaded areas represent NBER recession quarters. The thicker line represents a measure of credit expansion that can be approximately interpreted as the weighted growth rate of loans for institutions that increased lending between any two quarters. The thinner line represents a measure of credit contraction that can be approximately interpreted as the weighted growth rate of loans for institutions that reduced lending between any two quarters. The weights are the ratio between the value of credit extended by each bank and total aggregate lending. The measures of idiosyncratic flows are computed similarly, but after subtracting the trend of the growth rate of aggregate lending from individual growth rates.

Figure 3: Nominal and Idiosyncratic Gross Credit Flows for Selected Quantiles (1998:Q1-2008:Q4)



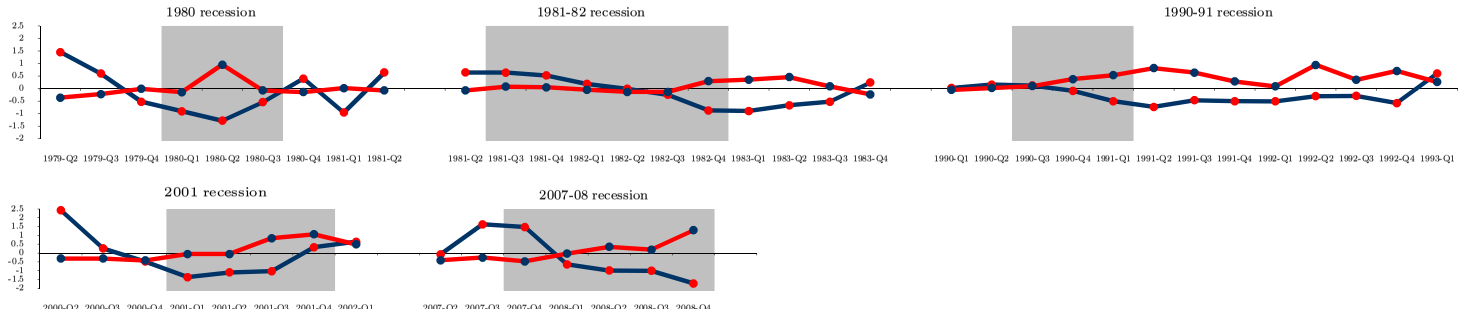
Note: Authors' calculations based on Call Report data. POS_t^+, NEG_t^+, $\widehat{POS}_t^+$, and $\widehat{NEG}_t^+$ include WaMu's loans. POS_t^-, NEG_t^-, $\widehat{POS}_t^-$, and $\widehat{NEG}_t^-$ exclude JPMorgan Chase. These series are plotted only for the recession that began in 2007. The entire series and their plots are available from the authors. The top top figures are quarterly nominal gross flows, the bottom four are quarterly idiosyncratic flows. Shaded areas represent NBER recession quarters. The thicker line represents a measure of credit expansion that can be approximately interpreted as the weighted growth rate of loans for institutions that increased lending between any two quarters. The thinner line represents a measure of credit contraction that can be approximately interpreted as the weighted growth rate of loans for institutions that reduced lending between any two quarters. The weights are the ratio between the value of credit extended by each bank and total aggregate lending. The measures of idiosyncratic flows are computed similarly, but after subtracting the trend of the growth rate of aggregate lending from individual growth rates.

Figure 4: Use of Credit Commitments by Type of Line of Credit, 1998:Q1-2008:Q4



Source: Authors' calculations based on Call Report data. Total unused commitments include the amounts of various lines of credit, such as home equity and credit card credit lines, that banks have committed to providing but which individuals and firms have not accessed. Other unused commitments include any loan commitments that are not home equity lines, credit card lines, or commercial real estate, construction, and land development credit lines either secured by real estate or not. "Maturity longer than 1 year" refers to the fraction of total unused commitments with original maturities greater than one year. C&I loans refers to Commercial and Industrial loans.

Figure 5: Cyclical Component of the Credit Expansion and the Credit Contraction Series for Total Loans around Five Recessions



Note: Authors' calculations based on Call Report data. The darker line with lighter dots is the cyclical component of credit expansion (POS), the lighter line with darker dots is the cyclical component of credit contraction (NEG). The cyclical components of nominal gross credit flows are derived by HP filtering the series to remove the trend components. Shaded areas represent NBER recessions.

Table 1: Gross Credit Flows: Summary Statistics

		1979:Q2- 1999:Q2					1999:Q1-2008:Q2				
		NET	POS	NEG	SUM	EXC	NET	POS	NEG	SUM	EXC
Aggregate loans											
Nominal flows	Average	1.76	3.18	1.42	-	2.69	3.08	4.40	1.32	-	2.64
	St. Dev.	1.46	1.02	0.62	-	0.98	1.66	1.43	0.54	-	1.07
Idiosyncratic flows	Average	0.01	2.12	2.08	4.2	-	-0.06	2.73	2.79	5.52	-
	St. Dev.	1.12	0.63	0.66	0.06	-	1.79	1.44	0.72	1.41	-
Commercial Loans											
Nominal flows	Average	0.68	1.79	1.11	-	1.94	2.24	4.67	2.42	-	3.73
	St. Dev.	0.97	0.57	0.47	-	0.63	2.77	1.19	2.09	-	2.09
Idiosyncratic flows	Average	0.01	2.8	2.71	5.52	-	4.84	6.74	4.97	2.48	-
	St. Dev.	1.36	0.87	0.72	0.84	-	1.86	1.38	1.24	1.15	-
Real Estate Loans											
Nominal flows	Average	1.04	1.68	0.63	-	1.26	3.75	4.87	1.12	-	2.23
	St. Dev.	0.57	0.46	0.22	-	0.44	1.76	1.56	0.48	-	0.97
Idiosyncratic flows	Average	0.01	2.27	2.12	4.39	-	-0.10	2.80	2.90	5.70	-
	St. Dev.	0.78	0.53	0.54	0.73	-	1.98	1.56	0.81	1.49	-
Individual Loans											
Nominal flows	Average	0.66	0.0197	1.3	-	2.11	2.75	5.49	2.74	-	5.22
	St. Dev.	0.11	0.72	0.63	-	0.7	2.73	2.40	1.23	-	2.14
Idiosyncratic flows	Average	-0.01	3.28	3.39	6.68	-	2.78	5.53	2.75	8.28	-
	St. Dev.	2.23	1.2	1.43	1.41	-	3.21	2.72	1.37	2.87	-

Notes: The data for 1979:Q1-1999:Q2 are from Dell'Ariccia and Garibaldi (2005); the data for 1999:Q1-2008:Q2 are based on the authors' calculations'.

Table 2: Gross Credit Flows: Cyclical Properties (1999:Q1-2008:Q2)

		St. Dev	x(-3)	x(-2)	x(-1)	x	x(+1)	x(+2)	x(+3)
GDP			0.39	0.64	0.85	1.00	0.85	0.64	0.39
Aggregate	POS	13.69	-0.06	0.02	0.15	0.38	0.27	0.30	0.26
Loans	NEG	13.90	0.00	-0.17	-0.35	-0.46	-0.44	-0.37	-0.33
	EXC	13.90	0.00	-0.17	-0.35	-0.46	-0.44	-0.37	-0.33
Commercial	POS	13.23	0.09	0.23	0.43	0.66	0.54	0.50	0.45
and Industrial	NEG	16.67	-0.20	-0.39	-0.52	-0.64	-0.62	-0.52	-0.43
Loans	EXC	14.98	-0.14	-0.28	-0.39	-0.47	-0.51	-0.40	-0.30
Individual	POS	17.19	-0.03	-0.08	0.04	0.13	0.02	0.01	-0.06
Loans	NEG	16.42	0.09	0.10	-0.03	-0.07	0.02	0.14	0.22
	EXC	16.33	0.11	0.09	0.00	0.01	0.10	0.16	0.22
Real Estate	POS	13.29	-0.05	0.04	-0.01	0.20	0.13	0.15	0.22
Loans	NEG	16.86	0.15	-0.01	-0.16	-0.26	-0.26	-0.17	-0.27
	EXC	16.86	0.15	-0.01	-0.16	-0.26	-0.26	-0.17	-0.27

Notes: Contemporaneous correlations with nominal GDP are in bold. All flows are seasonally adjusted using the X-11 procedure. All flows are cyclical diviations, i.e., the difference between the logs of the level of the series and their trends (Hodrick Prescott filter). Source: Authors' Calculations